

91.549, Mobile Robotics
Fall 2004
Prof. Yanco

Lab 1

Out: Thursday, 9 September 2004

Due: Thursday, 16 September 2004

Reading:

Dudek and Jenkin, Chapters 1 through 3

How to Think Like a Computer Scientist (linked from course web page)

Overview: In this lab, you'll be writing your first brains for the robot. You'll test your code first in the simulator (either Stage or Aria), then you'll run your code on the actual robot.

In lab today: On the course web site (<http://www.cs.uml.edu/~holly/91.549>), you'll find links to two Pyro modules: the Pyro introduction and Direct Control. You should read both modules completely. That said, focus on the sections that have been attached to this lab (The Pyro Interface, Sensors, Robot Attributes, Brains, Direct/Reactive Control).

To run a program on the Pioneer, you'll need to log on to neo, trinity or morpheus (accounts on the robots will be created for you). If you've written your code on your desktop machine, you'll need to scp it to the robot.

In addition to the exercises in the attached modules, write a direct control brain that will follow a person (or other object – the trash can outside the lab door works particularly well) at a hard coded distance. You do not need to have obstacle avoidance behavior in this brain. The robot should drive forward until it has an object that is the specified distance away from its front sonars (make this distance between 1 and 2 robots). It should then continue to move forward or backward to keep the object the required distance away from its sensors (note that moving forward or backward can happen in an arc – turn to keep the object in view). While you don't need to implement obstacle avoidance, do check when backing up to make sure that you will not hit a wall in the back. If there is something too close in the back while you're trying to get away from something in the front, stop.

What to turn in: Commented code for all exercises that you wrote code and your answers to questions in the exercises. You also need to demonstrate your wall following and person following code to me on the robot before class starts next Thursday.